

*Issued 29 November 2018*

## **PRELIMINARY MARINE ACCIDENT REPORT – COLLISION BETWEEN THE FRIGATE 'KNM HELGE INGSTAD' AND THE OIL TANKER 'SOLA TS' ON 8 NOVEMBER 2018, OUTSIDE THE STURE TERMINAL IN HJELTEFJORDEN IN HORDALAND COUNTY.**

*This report is a preliminary presentation of the AIBN's investigations relating to the accident and does not provide a full picture. The report may contain errors and inaccuracies. The final report will constitute the AIBN's official document relating to the accident and the investigation.*

Vessels:	The frigate 'KNM Helge Ingstad' and the oil tanker 'Sola TS'
Date and time (local time):	Thursday 8 November 2018, at 04:01.
Incident site:	Outside the Sture terminal in Hjeltefjorden in Hordaland County.
Weather conditions:	Clear sky, good visibility
Light conditions:	Dark
Type of transport operation:	A naval vessel in transit and a merchant tanker carrying crude oil.
Number of occupants:	137 persons on board 'KNM Helge Ingstad', 23 persons on board 'Sola TS'
Personal injuries:	No fatalities or seriously injured persons
Damage to the vessels:	Extensive damage to the frigate and minor damage to the tanker.
Sources of information:	Interviews with the operative crews involved, data from the vessels and the Norwegian Coastal Administration, including Fedje Vessel Traffic Service

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*All times referred to in this report are local times (UTC + 1 Hour), if not otherwise stated.*

### **Introduction**

This preliminary report is published to communicate the information obtained during the initial phase of the ongoing investigation. The purpose is to provide a brief update on how the investigation is progressing as well as a preliminary description of the sequence of events and disseminate safety-critical issues identified at this stage of the investigation. This preliminary report also identifies areas that need further investigation and describes lines of investigation that will be followed up.

The accident was a complex one, involving several individuals, bridge crews, vessels, a VTS and the interaction between them. The investigation is therefore demanding in terms of time and resources. The AIBN stresses that this is a preliminary report and that it may consequently contain some errors and inaccuracies. Because of considerations relating to the duty of confidentiality, classified material and the investigation process, the AIBN does not publish all its information at the present time.

## **Notification of the accident**

On the morning of Thursday 8 November 2018, the Accident Investigation Board Norway (AIBN) was informed of a collision between the frigate 'KNM Helge Ingstad' and the Maltese registered tanker 'Sola TS' in Hjeltefjorden, outside the Sture terminal in Øygarden Municipality in Hordaland County, Norway. The AIBN contacted the Defence Accident Investigation Board Norway (DAIBN) and it was decided to initiate a joint investigation into the accident, led by the AIBN. The AIBN then contacted the Marine Safety Investigation Unit of Malta (MSIU), which is also a participating party in the investigation; cf. Chapter 18 Section 474 of the Norwegian Maritime Code. The investigation is being conducted in accordance with Chapter 18 of the Norwegian Maritime Code and Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009 establishing the fundamental principles governing the investigation of accidents in the maritime transport sector.

## **The initial phase of the investigation**

In the course of the afternoon and evening of 8 November 2018, the AIBN arrived in Bergen with 14 representatives of the AIBN and the DAIBN, to initiate the investigation.

Interviews with the bridge crew on the tanker 'Sola TS', and the inspection of the vessel started the same day. The following day, the AIBN started its interviews with the bridge crew on the frigate 'KNM Helge Ingstad'. The AIBN has also conducted an inspection on board a similar frigate and interviewed several engine room and operations crew on 'KNM Helge Ingstad'. In addition, the AIBN has interviewed the pilot on board 'Sola TS' and personnel who were on duty at Fedje VTS.

The Voyage Data Recorder (VDR) from Sola TS has been secured and played back. It contains voyage data and audio recordings from the vessel's bridge. Radar data and automatic identification system (AIS) data have been obtained from the Norwegian Coastal Administration. Data from the bridge of 'KNM Helge Ingstad' have also been retrieved and secured.

The AIBN's initial investigation has focused on establishing a preliminary description of the sequence of events, and on mapping what took place on board 'KNM Helge Ingstad' and 'Sola TS' up until the time of the accident at 04:01, including the vessels' communication with Fedje VTS. The purpose has been to find answers to the questions of what happened, how it happened, and what were the circumstances surrounding the accident.

The investigation team has also started to map how the accident developed after the collision up until the time when all crew had been evacuated. In that connection, the AIBN has started to collect information to get a picture of the damage to the frigate, its damage stability, damage control procedures etc.

## **Preliminary description of the sequence of events**

On Thursday 8 November 2018, the frigate 'KNM Helge Ingstad' was on a southerly course in inshore waters north of Bergen. Navigation training was being conducted as usual during a transit voyage. Before the vessel entered Fedje VTS's service area, the crew notified that they would enter the area from the north and stated their planned route. This was logged by Fedje VTS at 02:40. During the southbound voyage at a speed of about 17–18 knots, the AIS on board 'KNM Helge Ingstad' was set to receiver mode (receipt only, no transmission of own data), the vessel's navigation lights were lit and the vessel could be observed by radar. 'KNM Helge Ingstad' established a listening watch on VHF channel 80, the VTS's working frequency for the area.

Shortly before 03:00, a pilot from the Norwegian Coastal Administration boarded the Malta-registered tanker 'Sola TS', which had been loaded with crude oil at the Sture terminal and was getting ready to depart. Two tugboats arrived soon after, to assist during the departure from the terminal.

At 03:13, the pilot on 'Sola TS' called Fedje VTS with the message that they were starting to unmoor and preparing for departure. The VTS confirmed receipt of the information. Around that time, there were three other northbound vessels in the area south of the Sture terminal.

At around 03:40, the navigation officer coming on watch arrived on the bridge of 'KNM Helge Ingstad', went through the handover procedure and was informed about vessel traffic in the waters by the officer leaving the watch. The three northbound vessels were registered and plotted on the radar on board 'KNM Helge Ingstad'. During the watch handover, an object with many lights was observed lying still just outside the Sture terminal.

At approximately 03:45, the pilot on 'Sola TS' notified Fedje VTS that the tanker was departing from the Sture terminal and heading west out Fedjeosen.

At approximately 03:55, the officer coming on watch on 'KNM Helge Ingstad' took over the watch, and the previous officer of the watch left the bridge.

Assisted by the two tugboats, the tanker 'Sola TS' started to move away from the quay at the Sture terminal. The vessel lay with its starboard side to the quay and the bow pointing south. When 'Sola TS' was sufficiently far from the quay, the vessel was turned to port to set the course at 350°, towards Fedjeosen. As 'Sola TS' was leaving the Sture terminal, three vessels approached from the south, at starboard quarter of the tanker, as it had now turned and set a northerly course. When 'Sola TS' left the quay, its navigation lights and deck lights were lit.

At approximately 03:57 the pilot observed the echo of a southbound vessel on the radar. The vessel was north of 'Sola TS'. The pilot saw the vessel's green light and that it would cross his course line, but did not have an AIS signal for the vessel.

At 03:58, the pilot called Fedje VTS and asked for the name of the vessel that was heading towards the tanker on the port bow. The VTS answered that they had no information about this vessel. The pilot and captain on 'Sola TS' then tried to contact the vessel in other ways. They flashed the Aldis lamp, and the pilot requested a 10-degree course change to 000° from the captain on 'Sola TS'.

At approximately 04:00, Fedje VTS called 'Sola TS' with the information that the vessel was possibly 'KNM Helge Ingstad'. Shortly thereafter, the pilot called 'KNM Helge Ingstad' and requested it to turn to starboard immediately. The bridge crew on 'KNM Helge Ingstad' replied that they could not turn to starboard before they had passed the object they saw on their starboard side.

Just after 04:00, 'KNM Helge Ingstad' was approximately 400 m from Sola TS. When 'KNM Helge Ingstad' did not change course, both the pilot and Fedje VTS called 'KNM Helge Ingstad' requesting the vessel to act. Shortly thereafter, 'KNM Helge Ingstad' carried out an avoidance manoeuvre, but it was too late, and the two vessels collided.

'KNM Helge Ingstad' sustained major damage in the collision. Control of the rudder and propulsion was lost. This caused the vessel to continue uncontrolled towards the shore, where it grounded at

04:11, approximately 10 minutes after the collision. As the vessel filled up with water, its stability and buoyancy deteriorated and 'KNM Helge Ingstad' was evacuated.

## **Preliminary assessments**

The preliminary description of the sequence of events is based on the AIBN's initial investigations, including interviews with operative crews, and data from the vessels and the VTS. The AIBN considers the bridge crew on 'KNM Helge Ingstad', the bridge crew on 'Sola TS' and Fedje VTS to be three main entities in this investigation. The communication and cooperation between these three entities and within each entity affected the sequence of events. A thorough investigation and analysis of these factors will require much work. However, the AIBN can make the following preliminary assessments of the sequence of events:

It was a clear night when 'KNM Helge Ingstad' sailed southwards along Hjeltefjorden, and the lights from the Sture terminal must have been visible from afar. When the terminal first became visible from 'KNM Helge Ingstad', 'Sola TS' was alongside at the terminal. Because the crew on 'Sola TS' were preparing for departure, the deck of the tanker was well-lit. At a distance it would be difficult to separate the lights on the tanker from the lights at the terminal. Also, the lights did not move as the tanker was still alongside quay. It is highly probable that both these factors gave the crew on 'KNM Helge Ingstad' the impression early on that the lights belonged to a stationary object.

After the watch change at around 03:40–03:45, this was the basis for the bridge crew's understanding of the situation. Even though 'Sola TS' left the quay at around that time, there continued to be little relative movement of the lights as the tanker turned from a southerly to a northerly course. The tanker's use of deck lights after departure also meant that the crew on 'KNM Helge Ingstad' were unable to spot the navigation lights on 'Sola TS'.

When 'KNM Helge Ingstad' at approximately 04:00 stated that they could not turn to starboard, it was based on a continued perception of the lights as being stationary and that a turn to starboard would send them straight into the lit object. They also believed that they were communicating with one of the three northbound vessels that they were monitoring on the radar. It was not until just after this that the crew on 'KNM Helge Ingstad' became aware that they were on collision course, at which time it was impossible to avoid a collision.

The AIBN's preliminary assessment is that the accident was not caused by any single act or event, but can be explained by a series of interacting complex factors and circumstances. The investigation team is seeking to identify and understand these factors. So far, the AIBN has not seen any indication of technical systems not working as intended up until the time of the collision.

The AIBN has started to map how the accident developed after the collision and up until the time when all crew had been evacuated. In that connection, the Norwegian Armed Forces, Norwegian Defence Material Agency, the Norwegian Navy, the Norwegian Armed Forces Material Safety Authority (NAFMSA) and the ship designer Navantia have been informed that they will be notified of a critical safety issue. The notification concerns the frigate's watertight integrity. A description of the content and background of the notification is attached to this report.

## **Further lines of investigation**

Based on its preliminary description of the sequence of event, the AIBN has identified a need for further and more thorough investigations in the following areas: human factors, collaboration on the bridge, training and procedures, traffic control, language and communication, technology, and technical, operational, organisational and strategic choices.

In its further work, the AIBN will also seek to get a clearer picture of the sequence of events during the phase of the accident that followed the collision, up until the time that the rescue operation was completed.

The investigation will not apportion blame and/or liability under criminal or civil law. Based on the investigation, the AIBN will determine whether there is a need to propose safety recommendations for the purpose of improving safety at sea, also including the armed forces perspective.

This is a complex accident, and the investigation will therefore be demanding on the time and resources also in the time ahead. This is a preliminary report and factors other than those mentioned here may be included or excluded from the continued investigation.

### **Access to information and data**

The investigation team has access to all available material and data, including information that may be subject to a duty of confidentiality or classified. On request, anybody who has information about the accident has a duty to give a statement to the investigating authority.

Like any organisation in which such an accident occurs, the Norwegian Navy has initiated its own internal investigation of the accident. The AIBN will have access to all relevant information, including the results of the internal investigation.

The parties involved have been very cooperative and forthcoming, and the AIBN has given the investigation top priority.

### **Investigation report**

A report on the accident will be published. Classified information will be handled in accordance with the Norwegian Security Act. If the investigation does not conclude in a final report within 12 months, the AIBN will publish a status report. It is important to point out that any safety-critical findings made before the report is published, that could affect the safety at sea and the armed forces, will be shared with the relevant organisations and authorities on a continuous basis.

Further updates on the status of the investigation will be published on the AIBN's and the DAIBN's websites.

Accident Investigation Board Norway

Lillestrøm, 29 November 2018

## **Appendix A – Safety alert, collision between the frigate 'KNM Helge Ingstad' and the tanker 'Sola TS' on 8 November 2018, outside the Sture terminal in Hjeltefjorden in Hordaland County**

In connection with the ongoing investigation into the collision between the frigate 'KNM Helge Ingstad' and the oil tanker 'Sola TS' on 8 November 2018 outside the Sture terminal in Hjeltefjorden in Hordaland County, the Accident Investigation Board Norway (AIBN) has identified some safety-critical issues that require immediate attention. Note that the AIBN is in an early phase of the investigation and that the circumstances will be subject to further investigation.

The AIBN has found safety critical issues relating to the vessel's watertight compartments. This must be assumed to also apply to the other four Nansen-class frigates. It cannot be excluded that the same applies to vessels of a similar design delivered by Navantia, or that the design concept continues to be used for similar vessel models. The AIBN assumes that its findings are not in conformity with the required damage stability standard for the Nansen-class frigates.

To start with, flooding occurred in three watertight compartments on board 'KNM Helge Ingstad': the aft generator room, the orlob deck's crew quarters and the stores room. There was some uncertainty as to whether the steering engine room, the aftmost compartment, was also filling up with water. Based on this damage, the crew, supported by the vessel's stability documents, assessed the vessel as having 'poor stability' status, but that it could be kept afloat. If more compartments were flooded, the status would be assessed as 'vessel lost' on account of further loss of stability.

Next, the crew found that water from the aft generator room was running into the gear room via the hollow propeller shafts and that the gear room was filling up fast. From the gear room, the water then ran into and was flooding the aft and fore engine rooms via the stuffing boxes in the bulkheads. This meant that the flooding became substantially more extensive than indicated by the original damage. Based on the flooding of the gear room, it was decided to prepare for evacuation.

The AIBN considers the vessel's lack of watertight integrity to be a safety issue relating to Nansen-class frigates and therefore issues the following two safety alerts.

### **Interim safety recommendation MARINE No. 2018/01**

The Accident Investigation Board Norway recommends that the Norwegian Defence Material Agency, in cooperation with the Norwegian Navy and the Norwegian Armed Forces Material Safety Authority (NAFMSA), conduct investigations into the issues identified during the initial investigation and implement measures as necessary to address safety.

### **Interim safety recommendation MARINE No. 2018/02**

The Accident Investigation Board Norway recommends that Navantia, the vessel's designer, conduct investigations into the issues identified during this initial investigation and to ascertain whether this is also an issue relating to other vessels. Furthermore, that Navantia issue a notification to relevant shipbuilding yards, owners and operators, advising on necessary measures to address safety.